

ARI TECHNICAL REPORT

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LEVEL

## Development of a Course Outline for Training UH1FS Instrument Instructor Pilots

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by

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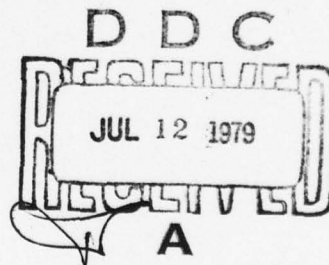
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20. ✓ with the subsequent development of the proposed course, but it should also be of general interest to others engaged in applying the ISD model in training program design. ↗

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## FOREWORD

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In recognition of the need for and importance of adequate training of instructor pilots (IPs) who conduct training in the UH1 Flight Simulator, the Army Research Institute for the Behavioral and Social Sciences contracted with Seville Research Corporation to initiate the development of (1) such a course of instruction for IPs, and (2) an Instructor's Guide that could be used to train unit IPs in the effective use of the UH1FS. As one foundation for these efforts, Seville completed a detailed survey of media used in past and present courses of instruction for UH1FS IPs and of media used to train console operators for this device. The results of that survey were reported in Seville Technical Report TR 77-10, A Review of Existing UH1FS Training Materials, in November, 1977.

The present report addresses the first of the above objectives. It provides an outline for a proposed exportable, self-contained course of instruction for UH1FS instrument IPs which can be used at UH1FS field locations to train unit instructor pilots in the effective use of the simulator. The report also describes the instructional development procedures that were employed in developing the course outline. These procedures should be of interest to personnel charged with the subsequent development of the course described in this report.

The second objective of the developmental effort is the preparation of a UH1FS Instructor's Guide, or handbook which can be used by the unit instructor pilot conducting instrument flight training programs using the UH1FS. The UH1FS Instructor's Guide, which is still under development, is intended to become an integral part of the proposed course of instruction outlined in this report.

The work reported here is being carried out under Contract Number DAHC 19-77-C-0039 between the U.S. Army Research Institute for the Behavioral and Social Sciences and Seville Research Corporation. Mr. Robert N. Isley is project director for Seville. Dr. James Bynum, ARI, Fort Rucker, Alabama, is the Contracting Officer's Technical Representative.

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DEVELOPMENT OF A COURSE OUTLINE FOR TRAINING  
UH1FS INSTRUMENT INSTRUCTOR PILOTS

BRIEF

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Requirement:

The Army has initiated a number of activities designed to improve the utilization of its growing fleet of simulators for the UH-1H helicopter, one of which has been an effort to standardize the aviator training programs in which the simulator is used. One such program for the simulator's use by individual rated aviators was developed and distributed to the field in the fall of 1977. An additional need exists, however, for a training program that can be used at field locations to prepare unit instructor pilots to use the UH-1H Flight Simulator (UH1FS) effectively in aviator training. This report describes the development of an outline for a course designed to prepare instrument instructor pilots to use the UH1FS in instrument flight instruction.

Procedure:

In addition to the preparation of this outline, the present project involves the development of a UH1FS Instructor's Guide, or handbook, that can be used by unit instructor pilots conducting instrument flight training programs in the simulator. The handbook will be published separately. The general approach in developing both the outline and guide has been to employ, where applicable, the instructional systems development model described in the TRADOC Pamphlet 350-30, Interservice Procedures for Instructional Systems Development. This involved a detailed analysis of the instructor's job in using the UH1FS and examination of existing training materials in terms of their utility for the course developed.

Findings:

An outline was developed for a course to prepare instrument instructor pilots to use the UH1FS in instrument instruction. In the process, it was found that: existing courses of instruction do not prepare unit instrument instructor pilots adequately in the effective use of the UH1FS; existing training materials, while useful for training UH1FS console operators, are of limited utility in the training of unit instrument instructor pilots in the effective use of the UH1FS; and development of an exportable, self-contained, self-instructional, multimedia course of instruction in use of the UH1FS for unit instrument instructor pilots is feasible. However, Army policy is permissive concerning whether UH1FS proficiency training is to be under the direct supervision of unit instrument instructor pilots.

Finally, the ISD model was helpful as a guide, but the model was inappropriate or insufficient with respect to certain of the developmental activities required in the present effort.

#### Utilization of Findings:

The principle value of the results of this research will be in the utilization of the outline in developing a course to prepare instrument instructor pilots to use the UH1FS in instrument flight instruction. However, the full development of such a course should be pursued only if the size of the eventual user population is large enough to warrant the required expenditure of funds. An uncertainty exists in this respect because the Army has not yet resolved the issue of whether the instructor pilot's participation in unit UH1FS proficiency training programs will be permissive or mandatory. Unless a significant number of unit instructor pilots are to conduct training in the simulator, the cost of further course development may not be justifiable.



DEVELOPMENT OF A COURSE OUTLINE FOR TRAINING UH1FS INSTRUMENT INSTRUCTOR  
PILOTS

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DEVELOPMENT OF A COURSE OUTLINE FOR TRAINING  
UH1FS INSTRUMENT INSTRUCTOR PILOTS

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I. INTRODUCTION

BACKGROUND

In the early 1970's, the U.S. Army Aviation Center, Fort Rucker, Alabama, accepted delivery of and subsequently tested its first modern helicopter flight simulator, the UH1FS, a simulator for the UH-1H helicopter. The UH1FS is the first of a planned family of flight simulators for the Army's operational helicopters. Collectively, these simulators are known as the Synthetic Flight Training System (SFTS).<sup>1</sup> Operational suitability testing of the prototype UH1FS was completed in 1972, and since that time production models of the simulator have been delivered to Fort Rucker and to other Army installations having large aviator populations. Seventeen UH1FS devices were in operation at bases around the world by the end of 1977, and more are planned.

The UH1FS is an expensive training device, and with its proliferation has come a recognition of the Army's need to develop more specific policies and procedures concerning the use of the equipment in order that the Army will realize maximum return on its investment.<sup>2</sup> One means of assuring such a return on investment is through the development of standardized training programs which exploit device training capabilities in a fashion likely to maximize the simulator's contributions to overall training goals. Toward this end the U.S. Army Aviation Center (USAAVNC) in 1977 developed a course of instruction (COI) designed to facilitate utilization of the UH1FS in instrument proficiency training of rated Army aviators at UH1FS field locations.<sup>3</sup>

The purpose of the COI developed by the USAAVNC is to provide UH-1 aviators a refresher program to be used, as necessary, to attain and maintain instrument flight proficiency. The course has multiple entry

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<sup>1</sup> SFTS units for the AH-1 (AH1FS) and CH-47 (CH47FS) are currently undergoing testing at Fort Rucker. SFTS units for the UTTAS and the AAH are in development, and simulators for the ASH and HLH are planned.

<sup>2</sup> Return on investment in this case would be aviators who are better trained and/or who are trained at lower overall cost.

<sup>3</sup> UH1FS Training Course, U.S. Army Aviation Center, August, 1977.

points into the training cycle for these "proficiency students"<sup>1</sup> so as to permit individualized instruction adapted to the particular deficiencies and training needs of individual aviators. In addition, the course is designed to be largely self-instructional and usable without the continuing assistance of an instructor pilot (IP). Thus, the existing course was not intended to prepare the IP in the use of the UHIFS, but, rather, was aimed at the proficiency student himself. IPs are often needed, however, to assist proficiency students who are having difficulties and to conduct other unit training programs which utilize the UHIFS, such as initial instrument qualification. Consequently, a training program to teach unit IPs how to use the simulator effectively is needed in addition to the COI that already exists for the proficiency students.

#### PRESENT PROJECT

Because of this need to train unit IPs in the effective use of the UHIFS, the Army Research Institute for the Behavioral and Social Sciences (ARI) contracted with Seville Research Corporation to develop an outline for a course of instruction and an Instructor's Guide that could be used to train unit instrument instructor pilots (IIPs) to use the UHIFS effectively in instrument training. The IIP course envisioned by ARI would be a multi-media, largely self-contained, self-instructional training package exportable to UHIFS field locations. The format for the course would permit an IIP to select relatively independent course segments appropriate to his needs and time available for training.

The Instructor's Guide is to be an information source for IPs during their initial UHIFS methods of instruction training, and a handbook when conducting subsequent student training activities. The Guide will explain how to use the various training features available in the UHIFS, many of which are not generally recognized by current users, in the accomplishment of flight training objectives.

#### Project Objectives

Thus, the overall objectives of this project are: (a) to develop an outline for an exportable, self-contained course to be used to train IIPs to use the UHIFS effectively, and (b) to develop an Instructor's Guide which will facilitate both IIP training to use the UHIFS, and subsequent training by IIPs of students in that device.

The achievement of these objectives required examination of all media used in past and present courses of instruction for UHIFS IIPs, as well as media relevant to the UHIFS that are or have been used in training programs for undergraduate and graduate aviators, and for UHIFS console

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<sup>1</sup> Proficiency students are rated aviators using the simulator to maintain their instrument flying proficiency.



operators. The media survey was completed and has been reported elsewhere.<sup>1</sup> The present report addresses objective (a) above. It presents a course outline for training IIPs to use the UHlFS and describes the development of the outline. As part of the description of this development, the manner in which the Interservice ISD Model was applied is given. A rationale underlying the formulation of the proposed course is provided, and recommendations concerning instructional media for the proposed course are made. The second objective will be achieved through the completion of an Instructor's Guide in the near future.

#### ORGANIZATION OF THIS REPORT

The present report, in addition to this introduction, contains (a) a section describing the approach followed in developing the course outline; (b) a section describing the results of a job information analysis (Phase I of ISD); (c) a section describing the instructional design (Phase II of ISD); (d) partial development of an instructional plan (Phase III of ISD); and (e) a section devoted to summary, conclusions and recommendations. In addition, there are four appendices to the report. Appendix A contains a table of instructional activities and associated information sources and UHlFS features. Appendix B contains a list of the training objectives for the proposed course of instruction. Appendix C contains the course outline, and Appendix D contains an abbreviated model of a practical exercise.

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<sup>1</sup> Isley, R.N., Miller, E.J., & Spears, W.D. A Review of Existing UHlFS Training Materials. Technical Report TR 77-10, Seville Research Corporation, Pensacola, Fla., November, 1977.

## II. APPROACH

The general approach in the present project has been to follow the course development guidelines, or ISD model, set forth in the pamphlet, Interservice Procedures for Instructional Systems Development (IPISD).<sup>1</sup> The five phases of this procedure are given in Table 1. Also shown are the major groups of activities comprising each phase. As presented in the referenced pamphlet, phases are designated by simple words specifying action: Analyze, Design, Develop, Implement, Control. For clarity, these titles are stated more fully in Table 1.

The present project was to develop a course outline rather than the course itself. Hence, only Phases I, II, and a portion of III could be used as guides. Further, several factors involved in this particular application of the ISD model dictated departures from some of the recommended procedures. For example, objectives were developed as in Phase II. Instead of developing tests per se, however, a rationale for evaluating attainment of objectives was presented. The reason for this departure from the ISD guide was that, as envisioned, the "tests" should be administered as exercises which involve learning activities as well as performance evaluations. Thus, these "tests" would be a part of the course content itself, and hence would be developed in the subsequent effort to design the course of instruction. As a second example, the recommended ISD procedure for validating a task list involves a survey of job incumbents to develop information concerning such things as the identification of performed tasks, and the frequency, criticality and difficulty level associated with each task. However, in the present instance it was found that job incumbents<sup>2</sup> did not perform many of the tasks that were of particular interest in this project, i.e., those tasks associated with effective training use of the UH1FS. Consequently, job incumbents were not an adequate source of information for the training analyst. In the present instance, information that was provided by job incumbents necessarily was supplemented extensively with information based on the investigators' expertise and familiarity with the training features of the UH1FS. Such departures from ISD procedures notwithstanding, the intent of the ISD model was followed as conditions warranted.

The approaches used for relevant portions of ISD are described below. Results obtained from these activities appear in subsequent sections. In examining the approach, the reader should keep in mind that the "Phases" referred to are the Phases of the ISD model.

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<sup>1</sup> Interservice Procedures for Instructional Systems Development.  
TRADOC Pamphlet 350-30, August, 1975.

<sup>2</sup> In a sense, there were few formal job incumbents, since many unit instructor pilots were not actively involved in using the UH1FS in proficiency training.

Table 1

MAJOR ELEMENTS OF IPISD

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Phase I: Analysis

1. Analyze job
2. Select tasks/functions to be trained
3. Construct job performance measures
4. Analyze existing courses
5. Select instructional setting

Phase II: Design of Instruction

1. Develop objectives
2. Develop tests
3. Describe entry behavior
4. Determine sequence and structure

Phase III: Development of Instruction

1. Specify learning events
2. Specify instruction management plan and delivery system
3. Review/select existing materials
4. Develop instruction
5. Validate instruction

Phase IV: Implementation of Instruction

1. Implement instructional management plan
2. Conduct instruction

Phase V: Control of Instructional Quality

1. Conduct internal evaluation
2. Conduct external evaluation
3. Revise system

## PHASE I: ANALYSIS

### Job Analysis

The job analysis had two facets. Initially, information was sought concerning the kinds of training instructor pilots administer using the UH1FS. It was suspected that present unit training involving the UH1FS varied from unit to unit. Hence, one concern was to determine how, to what extent, and by whom the UH1FS was being utilized in the field. Telephone interviews were conducted with simulator staff personnel at four UH1FS field locations (Forts Hood, Campbell, Stewart, and Bragg) to determine their patterns of simulator use. In addition, military and civilian flight instructors who use the UH1FS at Fort Rucker were consulted to determine device utilization practices there. The information gained in this fashion was used to determine, at a general level, what graduates of the proposed course of instruction should be able to do using the UH1FS.

The second facet of the job analysis was to determine more specifically the nature of simulator training activities, i.e., what does the instructor do in the simulator? To make this determination the instructional activities occurring during a typical simulator training period were analyzed in detail. In this case, a sequential listing of training activities, i.e., a flow model of the training period, was made and instructor roles and UH1FS information required to fill those roles were analyzed. The model encompassed all IIP activities from preflight planning through student debriefing. Table 2 presents an outline of the model, and Appendix A depicts the successive stages in detail.

### Select Tasks/Functions for Training

All of the training tasks and functions associated with instrument flying in the UH-1 aircraft have been shown in prior research to be trainable in the UH1FS.<sup>1,2</sup> These tasks and functions are described in the Rotary Wing Instrument Guide, a publication of the U.S. Army Aviation Center. The instrument instructor pilot is already capable of conducting instrument flight training activities in the aircraft, so the concern in the proposed course of instruction is to provide the additional training required for IIPs to conduct these same activities, or, more properly, to achieve these same training objectives, using the UH1FS.

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<sup>1</sup> Caro, P.W., Isley, R.N., & Jolley, O.B. Mission Suitability Testing of an Aircraft Simulator. Technical Report 75-12. Human Resources Research Organization, Alexandria, Va., June, 1975.

<sup>2</sup> HumRRO Division No. 6 (Aviation). A Test of Synthetic Training in Combat Readiness Proficiency Training. Unpublished Internal Research Report. Human Resources Research Organization, Fort Rucker, Ala., June, 1974.



Table 2  
SIMULATOR TRAINING FLOW MODEL OF INSTRUCTIONAL ACTIVITIES

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PREFLIGHT ACTIVITIES

1. Analyze scheduled training period
2. Analyze student(s) proficiency
3. Formulate training period
4. Organize learning events
5. Relate device features to learning events
6. Structure (design) period to encompass desired learning events
7. Prepare crew briefing
8. Conduct crew briefing
9. Complete required forms (1623 or equivalent)
10. Determine assigned cockpit is ready

IN-COCKPIT ACTIVITIES

1. Check "aircraft" log book
2. Set illumination/ventilation controls
3. Assist student(s) to fasten doors, adjust seats, pedals, & controls
4. Monitor trainer status information panel
5. Verify present trainer status
6. Modify trainer status as needed
7. Present learning events in proper sequence
8. Divide attention between student(s) and device
9. Monitor communications/interact with console operator
10. Record student(s) performance
11. Analyze student(s) performance
12. Identify problem areas
13. Formulate solution to problem/change instructional strategy
14. Propose solution to student(s)
15. Evaluate effectiveness of proposed solution
16. Critique student(s) performance
17. Solicit questions from students
18. Answer questions
19. Pace instruction/manage training period
20. Complete paper work

DEBRIEFING ACTIVITIES

1. Review performance
2. Inform student(s) of strong/weak areas
3. Suggest ways to overcome weaknesses
4. Solicit questions
5. Answer questions
6. Formulate next training period
7. Discuss next training period
8. Assign study material for next period
9. Complete paper work
10. Dismiss student(s)

This additional training should focus essentially on how to employ effectively the training features that are inherent in the UH1FS. Hence, UH1FS capabilities must be taught, as well as the means for their effective use. Specific tasks to be taught are those of using various UH1FS switches and controls to enable or disable particular device functions, and display uses and interpretations. Tasks of these types that are involved in simulator training were identified.

#### Identify Performance Standards

Performance standards that instrument instructor pilots must meet are stated in the Rotary Wing Instrument Guide. These same standards apply to the UH1FS. In addition, the instructor pilot graduate of the proposed course of instruction must be able to employ effectively a number of unique device features and systems in order to accomplish the instructional activities identified during the job analysis. The performance standards associated with the employment of these unique device features were identified. Generally these standards involved demonstrating knowledge of functions and sequences of tasks, and general integration of the use of such features into an instructional scenario.

#### Analyze Existing Courses and Training Materials

In this step, past and present syllabi of instruction involving the UH1FS were reviewed. In addition, current unit IP training practices at the four field locations were reviewed as stated above. From these reviews, existing training materials of possible use in the proposed course of instruction were identified. A report describing these reviews and presenting the results was prepared earlier.<sup>1</sup> Generally, such materials were found to be of limited utility for present purposes.

#### Select Instructional Setting

In this step, it was determined whether all of the needed instruction could be accomplished at UH1FS field locations and whether the design goal of a largely self-contained, exportable training package was feasible. This was accomplished through an analysis of the nature of the required training and the requirements it would engender, and examination of the training resources likely to be available at UH1FS field locations.

### PHASE II: DESIGN

#### Develop Training Objectives

In this step, relevant UH1FS features associated with the instructional activities identified in the job analysis were determined. From this analysis the knowledge requirements (enabling information)

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<sup>1</sup> Isley, R.N., et al., op. cit.

underlying the use of the relevant device features were derived. The derivation of the knowledge requirements was accomplished by examining the learning hierarchies underlying what the instrument instructor pilot needs to know about a particular device feature in order to utilize that feature in performing a given instructional activity. This body of information was then used to define the required course content and to develop training objectives with respect to the effective employment of relevant device features.

#### Develop Tests

In this step a means was developed for determining that the training objectives for the proposed course have been met. This was accomplished through an examination of overall job performance measures, the instructional setting proposed for the planned course, and the knowledge requirements underlying the use of relevant UH1FS features. Because specific performances during training exercises will be the recommended basis for instructor pilot trainee evaluations, and because the exercises incorporate learning activities which are to be defined in a subsequent stage of the project, tests per se were not developed during the present effort.

#### Describe Entry Behavior

In this step, information concerning the likely entry level characteristics of prospective course entrants was developed. This information was obtained from a study of the requisites and qualifications for instructor pilots (IPs), standardization instructor pilots (SIPs), and instrument flight examiners (IFE) as set forth in Army Regulation 95-63. In addition, current unit IP training practices at the four field locations mentioned earlier were reviewed.

#### Determine Sequence and Structure

In this step a conceptual framework for the proposed course of instruction was formulated, and a means of delivering the instruction to unit instructor pilots was posited. This was accomplished by grouping the informational content of the course into subject matter clusters or instructional blocks. These blocks or clusters were then assembled into a proposed sequence for the planned course. This process was guided by the desire to provide for multiple entry points into the training cycle.

### PHASE III: DEVELOPMENT

The Development Phase of the present project was limited to the preparation of a course outline and of a UH1FS Instructor's Guide. The course outline and the results of the application of the procedures described in the approach appear in subsequent sections of the report. The UH1FS Instructor's Guide is still under development and will be published separately.



The course outline emphasizes the use of modules as instructional vehicles. An explanation is in order as to how the modular approach was chosen. The guiding rationale was the desire to produce an eventual training program that is exportable, self-instructional, and largely self-contained. Also, multiple entry points are desired. Modular curricula adapt well to such requirements.

The choice of media to be used in the course also must conform to the same requirements. Hence, certain media or delivery techniques such as computer-assisted instruction (CAI), for example, were excluded from consideration. Not only would a delivery system involving CAI be difficult to provide at unit locations, the cost would be prohibitive.

Currently existing media were reviewed in an earlier report.<sup>1</sup> Such media included programmed texts, sound-on-slide programs, and videotape. Consideration was given to revising the existing programmed texts and sound-on-slide programs, which generally reflected console operator functions rather than IIP operations. Revising the programmed texts was rejected, however, because the scope of the revisions would require as much developmental effort as was expended on them originally. Revision of the sound-on-slide materials was also rejected, but only because the larger context within which these materials would have been employed proved to be impractical. Revision and expansion of the videotape approach was rejected, because of the desire to get away from the "lecture" method and to provide more hands-on training.

As a consequence, it was decided that the media to support the instructional program to be provided in the modules should be designed deliberately for the IIP training program. Revisions of existing media, while possible, would be unsatisfactory in terms both of cost and training effectiveness.

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<sup>1</sup> Isley, R.N., et al., op. cit.



### III. ANALYSIS

This section of the report describes in greater detail the results of the Analysis Phase of the ISD model as applied in this project. The job of the unit instrument instructor pilot is described, tasks and functions to be trained and their associated performance standards are identified, and an instructional setting for the proposed course is selected. In addition, results of the analysis of existing courses and training materials are summarized.

#### JOB ANALYSIS

There are three major training duties that UH1FS instrument instructor pilots can be expected to perform. These duties are (a) to conduct instrument proficiency training or refresher training in the UH1FS, (b) to conduct initial issue instrument qualification training in the UH1FS, and (c) to conduct instrument instructor training in the UH1FS. Each of these training duties will be described briefly. These descriptions will then be followed by an analysis of UH1FS IIP instructional activities and an examination of existing courses.

#### Instrument Instructor Training Duties

Instrument Proficiency or Refresher Training. The conduct of instrument proficiency and refresher training is the main reason the UH1FS has been deployed and is the largest use to which the device is put in the field. Typical proficiency or refresher training consists of an orientation and diagnostic evaluation flight in the simulator followed by a series of prescriptive refresher training periods as required, based on the evaluation of the aviator's current proficiency. The refresher training periods may be followed by an instrument checkride, also flown in the simulator. Army Regulation 95-1 requires use of the UH1FS (where available) in meeting annual minimum hours of instrument flying. This Regulation also allows aviators to renew their instrument cards on the basis of successfully completing a checkride in the simulator. Proficiency/refresher training, therefore, is likely to remain a major training activity of the unit IP. Graduates of the planned UH1FS IIP course will be expected to conduct this training.

Initial Issue Qualification Training. The number of Army rotary wing aviators who have never had a standard instrument rating is decreasing. Nevertheless, field units still conduct initial issue training for those assigned aviators who, for one reason or another, have never had a standard instrument rating. While the need to conduct initial issue training will continue to decrease in the future, it is still considered a major training activity of the unit IIP. The content of this training at the unit level is similar to that of the instrument phase of undergraduate aviator training at the USAAVNC. It differs from

the refresher training referred to above in the amount of training time required and the depth of subject matter coverage. The nature of the subject matter, i.e., instrument maneuvers and procedures, and the end-of-course objectives, i.e., passing an instrument checkride, are the same as those for refresher training. Graduates of the planned UHIFS IIP course must be able to conduct this type of training.

Instrument Instructor Pilot Qualification Training. In IIP Qualification Training, the UHIFS IIP trains unit IPs to become IIPs in the proficiency and initial issue training programs referred to above. The entrants to this training program are the primary targets of the planned course of instruction being developed in this project. That is, the course being developed is designed to provide the unit instructor pilot with the skills and knowledges necessary to conduct proficiency and initial issue type training in the UHIFS.

#### Instructional Activity Analysis

The instructional activities that are conducted by IIPs in the UHIFS are shown in tabular form in Appendix A. The table outlines the instructional process involved in the conduct of a typical simulator training period, from preflight planning through debriefing. In addition, the table shows the conditions and standards which apply to the instructional activities and the resources required, and relates specific UHIFS characteristics or features to the instructional activities shown. Of particular interest in the activity listing in Appendix A is the highly interactive nature of instructional activities and the high proportion of activities requiring information processing and decision-making skills. The problem for the UHIFS IIP is how to get the most out of his equipment in fulfilling a training objective. It is not just a question of knowing equipment capabilities and limitations, but also one of knowing how to take selective advantage of equipment characteristics in order to maximize the probability that student learning will occur. Using the equipment, of course, requires knowing how to operate certain device switches and controls. Those operations comprise part of the IIP's task as well, but it is the selective employment of device capabilities in an individually prescriptive manner to enhance learning that characterizes the more effective instructor. In short, he is a training system manager.

The activity list and related information in Appendix A reveal that to use the UHIFS effectively, the IIP must possess a great deal of information about UHIFS subsystems, must process (integrate) such information in relation to ongoing training activities and objectives, and revise, adjust or modify subsequent training period activities accordingly. To illustrate this process, an example is shown in Figure 1. On the surface, the activities depicted in the Figure appear very simple and straightforward. However, as shown in Appendix A, IIP performance of the verification activity involves processing information about at least eight device features or subsystems: trainer status information panel, the motion system, the cockpit instrument panel, audio system, seat

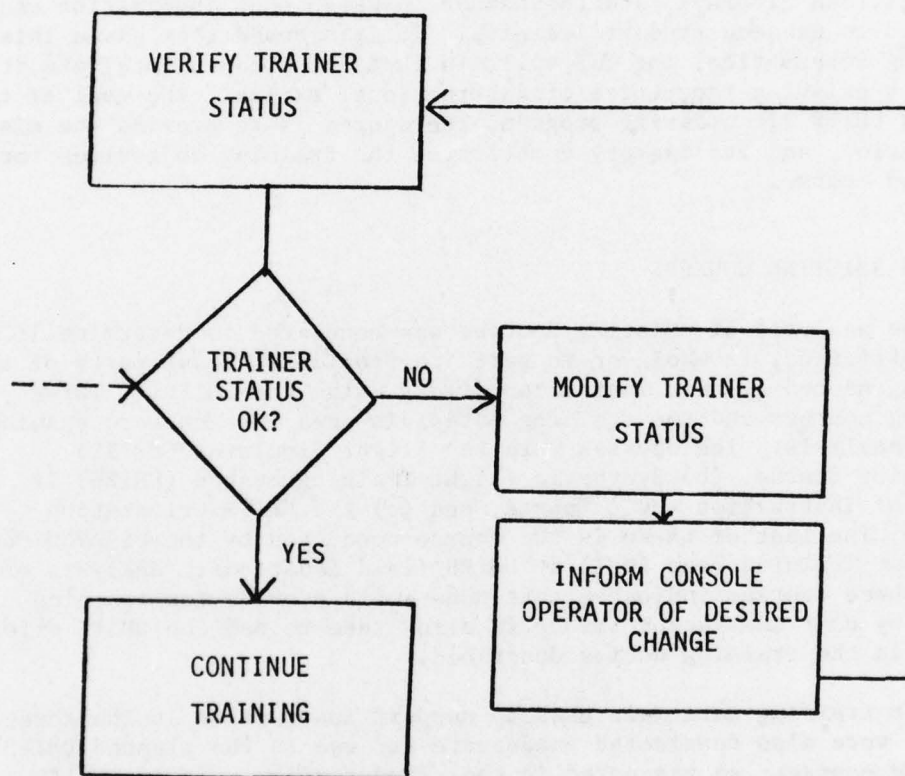


Figure 1. Example of an Instructional Process Activity



shaker, problem control panel, CRT status display, and CRT gaming area display. Further, this activity is performed repeatedly throughout the in-cockpit portion of the training period.

From a process standpoint, this is what the IIP does when teaching in the actual aircraft, i.e., he processes and integrates information and adjusts his instructional activities according to the changes in student needs and the situation. The difference in the use of the UHlFS is that the typical IIP does not, simply by virtue of his aircraft experience, possess all the information needed to manage the UHlFS training system effectively. The information that is missing concerns the location, function, and possible uses of UHlFS features, controls, switches, and displays, and the manner in which such information can be employed to enhance student learning. It is assumed that given this enabling information, the IIP will, in fact, be able to integrate it into his existing repertoire of instructional skills. The goal of the planned UHlFS IIP training program, therefore, is to provide the missing information, and its mastery constitutes the training objectives for the proposed course.

#### ANALYZE EXISTING COURSES

The analysis of existing courses was conducted to determine if they were sufficient, in whole or in part, to provide at least parts of the training needed by unit instructor pilots using the UHlFS.<sup>1</sup> Three existing courses and the training materials used in each were examined in the analysis. The courses were (a) Flight Simulator (UHlFS) Specialist Course, (b) Synthetic Flight Training System (UHlFS) IP Method of Instruction (MOI) Course, and (c) the UHlFS Orientation Course. The last of these is the course conducted by the USAAVNC New Equipment Training Team (NET) at UHlFS field locations. Analysis of these three courses indicated that none would provide the training needed by unit instructor pilots to allow them to use the UHlFS effectively in the training duties described.

The training materials used to support instruction in the three courses were also considered inadequate for use in the planned UHlFS IIP training course. As was noted in the cited review, existing UHlFS training materials, i.e., programmed texts, sound-on-slide programs, and videotape programs, were found to be deficient in a number of particulars. Essentially, the basic problem with the programmed texts and sound-on-slide programs was that they were designed for console operator training and, hence, contained much information that was considered unnecessary for IIPs to know and did not contain information that was necessary. Specifically, these materials tended to focus on "knobology" rather than on how various device features can be used to enhance student training. The videotape programs, on the other hand, were considered

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<sup>1</sup> See Isley, R.N., et al., op. cit., for a full discussion of the results summarized here.



training. The videotape programs, on the other hand, were considered too introductory in their emphasis. Thus, either new training media would have to be developed to support the planned IIP course or major revisions of existing media would be required. On the basis of all considerations, it was concluded that the development of new materials would be more effective and economical.

#### INSTRUCTIONAL SETTING

The development of a largely self-contained, exportable training program for use by the unit IIPs was an original Army goal, and it was determined in this project that such a program was feasible. The basis for this conclusion was simply that, after analyzing IIP job requirements in light of his qualifications upon entry into training, it was evident that a course fulfilling the Army's goal could be designed. Thus, the instructional settings for the proposed course of instruction outlined in this report are to be the field site locations of the UH1FS. Most of the required training will take place in the UH1FS itself, with some use made of adjacent briefing or classroom space. Operation of the UH1FS will, of course, require console operators and other simulator support personnel.

#### IV. DESIGN OF INSTRUCTION

Phase II of the ISD process concerns the design or initial formulation of the planned course of instruction. Information generated in the Analysis Phase was used to develop training objectives and a testing rationale for the tasks to be trained, to determine the course entry skills of the IPs, and to determine the sequencing and structure for the proposed instruction. This section of the report contains documentation of the results of the ISD Design Phase.

##### TRAINING OBJECTIVES

The training objectives for IIP UH1FS training identify the skills and knowledges required for the IIP to use the various UH1FS features effectively in conducting his required instructional activities (shown in Appendix A). Because particular device features or systems are the foci of the course developed here, specific objectives were grouped by relevant device features/system. The device features/systems are identified in Table 3 below, as are the numbers of objectives associated with each. Appendix B lists these objectives, separately by device feature/system. In each case, an objective states specifically what an IIP should be able to do after successfully completing the course. For example, one objective in the ATC Record/Playback group states, "The IIP will be able to use this feature to provide feedback to students on their use of standard phraseology for ATC messages." Another example of such objectives, for the Problem Control Panel, "The IIP will be able to use this feature to activate/deactivate the motion system."

The order of the listing in Table 3 and Appendix B is alphabetical. It does not denote sequencing of materials in the proposed course.

##### TESTING

The evaluation problem in the proposed course of instruction will be to determine whether or not the IIP can, in fact, use UH1FS device features in the manner indicated in Appendix B to accomplish the instructional activities shown in Appendix A. The preferred way to make such a determination is directly through a performance-based evaluation procedure. The IIP should demonstrate that he can access UH1FS capabilities and use them appropriately in achieving instructional goals. Evaluations, then, should be made during appropriate exercises in which the IIP practices simulator use. Provisions for such exercises have been incorporated into the course outline.

Table 3

## DEVICE FEATURES/SYSTEMS AND NUMBERS OF RELATED OBJECTIVES

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	<u>Feature/System</u>	<u>Number of Objectives</u>
1.	ATC Record/Playback	3
2.	Audio Alerts and Coaching Messages	4
3.	Automatic Copilot	4
4.	Automated Training Programs	9
5.	Communication/Navigation Display	8
6.	Gaming Area Map Display	20
7.	Ground Controlled Approach Display	3
8.	Hard Copy Printer	5
9.	Initial Condition Sets	3
10.	Maneuver Record/Playback	6
11.	Overhead Panel Display	4
12.	Problem Control Panel	12
13.	Simulated Aircraft Malfunctions	6
14.	Trainee Score Panel	4
15.	Trainer Status Display	18
16.	Trainer Status Information Panel	6
17.	Visual Error Alerts	5

## ENTRY SKILLS

In order to eliminate unnecessary training, the skill and knowledge capabilities of the trainee entry population must be known. In the proposed course of instruction, it is assumed that the course entrant will be a unit instructor pilot who is already qualified to conduct instrument flight training activities in the UH-1H aircraft. The fact that the course entrant is already a qualified instrument instructor pilot obviously has implications for UH1FS IIP course development, so it is important to know something about instructor pilot requisites and qualifications, and current instructor pilot training objectives and procedures.

Army Regulation 95-63 prescribes the requirements for the qualification and designation of Army aviators as instructor pilots. In addition to specifying a requirement for a minimum number of first pilot flight hours and other general criteria, AR-95-63 stipulates that the aviator shall be a graduate of a formal instructor pilot course or shall satisfactorily complete an IP equivalency evaluation administered by a representative of the Directorate of Evaluation and Standardization (DES), U.S. Army Aviation Center. Therefore, UH-1 instructor pilot candidates must either attend the formal UH-1 Instructor Pilot Course conducted at Fort Rucker or acquire the designation through unit training and an equivalency evaluation.

However, completion of the UH-1 IP Course at Fort Rucker does not qualify the graduate as an instrument instructor pilot (IIP), because instrument methods of instruction training is not included in that course. Additional training is required for IIP qualification. While such training is also available at Fort Rucker, it is ordinarily handled as a unit responsibility. FORSCOM Regulation 350-3 permits unit commanders to publish local orders designating selected unit aviators as instrument instructor pilots (IIPs), and these individuals may or may not have had instrument methods of instruction training.

The proposed course of instruction described in this report is for aviators who already are qualified IIPs, not IPs in training for IIP qualification. This distinction is important because of its impact on the likely entry skills of trainees in the proposed course and the consequences for subsequent course design.

Installations with UH1FS devices have a unique capability for providing unit aviators with the specialized instrument instructional skills required of the IIP. Some installations with the UH1FS have already started using the device to accomplish such training.<sup>1</sup> Therefore,

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<sup>1</sup> The development of a standardized course of instruction to provide selected unit aviators with their initial instrument methods of instruction training is beyond the scope of the project. Development of such a course would require additional effort.



although all entrants to the proposed course will be qualified IIPs, some will have obtained their IIP qualification in a training program using the UHIFS, while others will not. Thus, the range of skills and knowledge of the UHIFS for entering trainees of the proposed course will run from those of the entrant who has never seen the UHIFS, to those of the entrant who received his initial IIP training in the device. The proposed course of instruction must be designed to accommodate the entire range of likely entry trainee capabilities.

#### SEQUENCING AND STRUCTURE OF THE PLANNED COURSE

The proposed course will be comprised of a sequence of nine modules. These are described further in Section V below and in Appendix C. The modules do not form a rigid hierarchy, but to one with no familiarity with the UHIFS it would be best to master the modules in sequential order. The composition of the modules permit multiple entry points, however, for trainees with varying degrees of familiarity with the device.

Each of the first eight modules has two types of activities to be performed in order. These are (a) acquisition of information, and (b) practical exercises. Brief descriptions of these activities follow.

Acquisition of Information. In keeping with the design goals for a self-contained, self-instructional course of instruction, it is proposed that required enabling information be acquired through individual study of appropriate references. The major instructional references will be the UHIFS Instructor's Guide being developed in the present project. The Guide will be supplemented by the UHIFS Operator's Manual and a series of existing videotape programs describing various simulator features. These references are further supplemented, where appropriate, with the standard Army documents pertaining to instrument flight operations. (These source materials are identified in Appendix A and in Appendix C.)

Practical Exercises. It is proposed that following the individual study of appropriate references, including the viewing of the appropriate videotape programs, the IIP will complete one or more practical exercises in the UHIFS. These exercises will be largely self-conducted. The directions for each such exercise will be recorded on a cassette tape which the IIP can play in the cockpit. The tape will direct his attention to specific device switches, controls, displays, or other device features and will provide directions for using them. Directions for console operator assistance in completing the exercise would also be recorded on the tape. Such recordings are not presently available and will, of course, have to be developed. A possible scenario for one such recording is provided in Appendix D as an example of how the practical exercises can be developed.

Practice Teaching. It is proposed that following the completion of the first eight modules, another series of exercises consisting of mock

training activities, i.e., practice teaching, be completed. These practice teaching exercises comprise Module Nine. Their function will be to verify that the IIP has mastered the information presented earlier and is competent to conduct actual student training using the UHIFS. These exercises will require the services of an evaluator, e.g., a standardization instructor pilot, and one or more mock students. The exercises themselves will involve conduct of typical syllabus training periods from the proficiency/refresher and initial issue training programs.

## V. DEVELOPMENT OF INSTRUCTION

In the Development Phase of ISD, the planned course of instruction will be fully developed. The scope of the present project, however, calls for only two products of this phase to be completed: (a) the course outline, which appears in Appendix C and which is the focus of this report, and (b) the UH1FS Instructor's Guide, still under development and to be published separately at a later date. This section of the present report contains a description of the course outline and states requirements for future course development.

### THE COURSE OUTLINE

#### Overview of the Planned Course

The design goals of the planned UH1FS IIP course are that it be multi-media, largely self-contained, self-instructional, and exportable to the field as a generally complete training package. Achieving these goals or criteria in future course development activities will be a challenge to the course developers. However, the course outline as presented in Appendix C is consistent with these goals, and if it is followed in course development, the final course product should meet the criteria outlined.

The organization of the proposed course is conceived as a series of nine learning modules. The subject matter to be covered in each module is given by the titles below:

- Module One: Introduction to the UH1FS
- Module Two: Introduction to In-cockpit Device Operations
- Module Three: In-cockpit Device Operations, cont'd.
- Module Four: Performance Assessment Features
- Module Five: Record/Playback Features
- Module Six: Automated Training Programs
- Module Seven: Console Operations
- Module Eight: Administrative Records & Forms
- Module Nine: Practice Teaching

Each learning module would consist of a period of individual study of appropriate portions of written and other references that would be

provided in the exportable training package. The individual study period would be followed by one or more practical exercises in the UHlFS. Completion of the practical exercises for each module would indicate trainee readiness to begin the next learning module. Each learning module would focus on a specific content area, activity, or collection of related activities designed to provide the unit IIP with the information and experience he will need to utilize the UHlFS effectively in training. This sequence of activities would continue until all learning modules are completed.

The availability of unit IIPs to attend a formal, full-time course of instruction will be limited. Most likely, they will be required to continue their routine duties while learning to use the UHlFS, and their availability to participate in the planned training course will likely be limited to a few hours per day at most. The proposed course of instruction must take this likelihood into account, and the proposed learning modules should be designed so that they can be completed on a time-available basis. Completion of a given module, therefore, might require several training sessions, or it might be completed in a single training period. This will depend on the IIP's past experience, abilities, and time available. Further, it is likely that IIPs will not be available for group instruction, and the modules must be designed for individual or self-instructional training. The course outline in Appendix C reflects the modular structure as conceived for the planned course.

#### Organization of Course Outline

The course outline in Appendix C identifies each learning module by topic, identifies the content areas or subject matter of the module, provides a statement of the general training objectives associated with each content area, and identifies appropriate references to support the indicated instruction. The cited references also identify available sources which subsequent course developers will need to consult in order to complete the modules, as well as proposed media not presently available but needed to accomplish the objectives of the modules.

#### Composition of the Learning Modules

The modular approach to course organization has been taken for several reasons, the most compelling of which has been the desire to make the training program adaptable to self-instructional use on a time-available basis. Other reasons are the need for multiple entry points into the cycle, and the nature of the material to be mastered during IIP training. This latter point bears on the composition of the modules and is elaborated upon below.

Ultimately, the UHlFS IIP's mission is to train students using the simulator as well as the aircraft. As previously stated, it is assumed that before entering the present course they will be qualified to administer instrument instruction in the aircraft. With respect to the effective



use of the simulator, the IIP must learn and be able to integrate a great deal of information concerning the simulator and how its training features can be employed in carrying out his mission, i.e., training proficiency and initial issue students. This enabling information is covered in the first eight modules indicated in the course outline.

Typically, completion of each of the first eight modules will involve a period of study of appropriate references and the viewing of a short videotape introducing the subject. This will be followed by one or more practical exercises in which the information conveyed via references and videotape can be put to use in operating the simulator. These exercises are intended to provide the IIP with hands-on experience in operating device controls, interpreting displays, and exercising various device features. While all of the exercises will require the services of a device console operator, a design goal is to minimize the involvement of personnel other than the "student" IIP. Of necessity, however, some exercises will require the services of an aviator to "fly" the simulator while the student IIP is engaged in activities at the instructor station in the cockpit, or at the console operator's station outside the cockpit.

The IIP training course not only must provide the IIP with enabling information, it also must provide him with experience in employing that information in an operational context, i.e., during student training. A suitable method for meeting the latter requirement is to provide mock training or practice teaching experience as part of the MOI training. This method has been selected for use in the proposed IIP training program because of previous success in its use, and the final module in the course outline consists of such practice teaching.

The practice teaching module, as conceived, will be composed entirely of practical exercises. In contrast to the earlier exercises, which were designed primarily as a means of presenting and/or reinforcing enabling information concerning device operations, the practice teaching exercises in this module are to be evaluative as well as instructional in nature and will require the IIP to conduct one or more syllabus training periods in the UH1FS. Conduct of this series of exercises will require the participation of an evaluator to monitor and critique the IIP's performance. The purpose of these exercises is to ascertain IIP mastery of the information contained in the earlier modules and to certify his readiness to commence actual student training activities with the device.

#### THE UH1FS INSTRUCTOR'S GUIDE

Frequent reference is made in the course outline and elsewhere in this report to the UH1FS Instructor's Guide, a document under concurrent development at the time of preparation of this report. The need for this document and its intended purpose are explained below.

In the review of existing UH1FS training materials,<sup>1</sup> a number of guides and handbooks were examined to determine their usefulness in the planned course of instruction. These existing guides were found to contain useful information, but were considered generally deficient in a critical area; they generally lacked information relating specific device features and systems to training uses. That is, the guides contained little information telling instructors how to employ device features to enhance the learning process. The UH1FS Instructor's Guide being developed in the present project is intended to remedy this deficiency. The new Guide will contain much of the information found in existing guides, but will expand that information and will focus on how IIPs can use simulator features to enhance student learning.

The UH1FS Instructor's Guide is intended to serve as the basic reference document, or textbook, for the planned UH1FS IIP course of instruction. As such, the Guide will serve as a handbook concerning the location, function, and suggested training uses of UH1FS features as they relate to the conduct of aviator training and evaluation in the simulator. During IIP training, information contained in the Guide will be supplemented by the other media shown in the reference blocks of the course outline. In addition to serving as a basic text in IIP training, the Guide will be a ready reference document that can be consulted by the IIP for information frequently needed in simulator flight planning activities and during in-cockpit training activities.

Since the UH1FS Instructor's Guide is being developed as a part of this project and thus in advance of the other materials for the planned course of instruction, it will be available to UH1FS instrument instructor pilots well before the entire IIP course is ready. It is expected that early distribution of the guide to all UH1FS field locations will enhance utilization of the simulator by current IIPs.

#### FUTURE COURSE DEVELOPMENT REQUIREMENTS

##### Proposed New Media

The proposed new media will consist of a collection of audio cassette recordings which will be used in conjunction with the practical exercises identified in the course outline. The practical exercises are intended to supplement written course material and to provide the IIP with "hands-on" experience in employing the information derived from written and other sources. As envisioned, the cassette tapes will guide the IIP through exercises, much as tapes guide students through slide-tape instructional materials. When appropriate during the conduct of an exercise, tapes will guide the console operator as well. The scripting of the scenarios for these exercises and the recordings of them are

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<sup>1</sup> Isley, et al., op. cit.

matters for subsequent course development activities. (An example script for a tape which illustrates the type of instruction intended appears in Appendix D).

#### A Plan for Subsequent Course Development

The UHlFS Instructor's Guide will be the first element of the planned course to be completed. This Guide can supplement or replace some materials currently in use for IIP training. Meanwhile, the learning modules are to be developed, and some consideration of the order of their completion may be useful to subsequent course developers.

The planned course of instruction for UHlFS IIPs will likely be developed in sequential stages rather than all at once. This building block approach could be followed until the entire training package is completed. The modular structure proposed for the course lends itself well to such a development scheme.

The order of development of the learning modules should proceed from Module One to Module Nine, with one notable exception, Module Six, Automated Training Programs. It is suggested that development of this module be undertaken last, because the training effectiveness of the automated training programs currently available in the UHlFS has not been determined, and reports from the field have indicated that relatively little use is being made of these programs when the instructor is in the cockpit.<sup>1</sup> Further, research activities programmed by the ARI to investigate automated training in the UHlFS will likely provide information of considerable use in the preparation of the module covering automated training. Thus, the preparation of Module Six would likely benefit from the proposed delay in its development.

The course outline described in this report must be considered a working draft. Subsequent course development activities may dictate changes to the proposed format and structure of the planned course. For example, an initial tryout of the learning modules, as proposed in the outline, may reveal a need to shift some content areas from one module to another. The further development and preparation of the practical exercises shown in the outline may also suggest changes that would improve the composition of the learning modules. An inherent advantage of the modular approach taken in developing the course outline is, of course, the flexibility with which such improvements can be accomplished.

#### An Additional Consideration

This report has been prepared under the assumption that subsequent course development will, in fact, occur. A note of caution is in order,

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<sup>1</sup> Isley, R.N., and Miller, E.J. The Role of Automated Training in Future Army Flight Simulators. Final Report FR-ED-76-27. Human Resources Research Organization, Alexandria, Va., October, 1976.



however, concerning this assumption. In the survey of current training practices at UH1FS field locations, it was found that the trend within the Army appears to be away from IIP involvement in the conduct of instrument proficiency training in the UH1FS. In many instances, instructor pilots became involved in such training very irregularly, if at all, with the bulk of proficiency training for the individual aviator being accomplished under self-supervision without an instructor in the cockpit. Given this permissive trend concerning IIP involvement in proficiency training, one might well question the need for a UH1FS IIP training program.

Considerable developmental effort will be required to complete an exportable training package along the lines described in this report. As has been noted, the user of that package has been assumed to be an IIP, and the focus of the course would be to give him the skills required to use the UH1FS effectively in proficiency/refresher training for unit pilots. If such training is not to be directly administered and supervised by the unit IIP, then there would be serious question concerning the size of the IIP population who would use the planned course. It would seem prudent, therefore, to obtain clarification of Army policy with respect to the use of instructor pilots as UH1FS instructors before proceeding with the development of the planned course.



## VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

### SUMMARY

As part of the Army's general efforts to achieve maximum training benefit from the use of its fleet of flight simulators (UHIFS) for the UH-1H helicopter, the present effort has developed the outline for a course intended to train unit instrument instructor pilots (IIP) in effective use of the UHIFS. Their principal use of the UHIFS would be in connection with the instrument proficiency/refreshers training of unit aviators or, in some instances, in the initial instrument qualification of unit rotary wing aviators. Based on the characteristics of the IIP group who would use the planned course, as well as on Army guidance concerning desired characteristics of the course, an exportable, self-contained, self-instructional, multi-media course concept was developed. The development of this course concept was governed by the general guidelines of the Interservice Procedures for Instructional Systems Development. A second aspect of the present project, to be reported separately, is the development of a UHIFS Instructor's Guide to be used as the basic training reference source in the proposed course.

In connection with the development of the course concept and the UHIFS Instructor's Guide, existing courses and training materials dealing with the use of the UHIFS were reviewed for applicability. This review indicated that existing courses and media were inadequate to serve the needs of the projected course and that new media should be developed.

As a result of these activities, a nine module course concept was developed, and the present report presents the outline for this course, along with the objectives for the course. Full development of these modules was beyond the scope of the present effort, but a recommended plan for such development was prepared. The first eight of the course modules are devoted to providing enabling information about the UHIFS with practice "hands-on" exercises provided for in each module. The ninth module is conceived as a series of exercises in which the IIP would practice teaching instrument flying skills to mock or actual students. Evaluation of IIP trainee performance would occur during these practice teaching exercises. The contents of these modules are conceived to be as follows: (a) Introduction to the UHIFS; (b) Introduction to In-cockpit Device Operations; (c) In-cockpit Operations (cont'd.); (d) Performance Assessment Features; (e) Record/Playback Features; (f) Automated Training Programs; (g) Console Operations; (h) Administrative Records and Forms; and (i) Practice Teaching.

### CONCLUSIONS

On the basis of the information developed in this effort, the following conclusions are warranted:

1. Existing courses of instruction do not prepare unit instrument instructor pilots adequately in the effective use of the UH1FS.
2. Existing training materials, while useful for training UH1FS console operators, are of limited utility in the training of unit instrument instructor pilots in the effective use of the UH1FS.
3. Development of an exportable, self-contained, self-instructional, multi-media course of instruction in use of the UH1FS for unit instrument instructor pilots is feasible.
4. Army policy is permissive concerning whether UH1FS proficiency training is to be under the direct supervision of unit instrument instructor pilots.
5. The ISD model was helpful as a guide, but the model was inappropriate or insufficient with respect to certain of the developmental activities required in the present effort.

#### RECOMMENDATIONS

Based on the results and findings of this effort, the following recommendations are made:

1. Army policy concerning whether the instructor pilot's participation in unit UH1FS proficiency training programs will be permissive or mandatory warrants resolution so that the nature and size of the potential user population for the course outlined in this report can be clarified. Unless unit instructor pilots participate in UH1FS proficiency training to a significant degree, it is possible that the size of the potential user population for the planned course will be insufficient to warrant the expenditure required for its full development.
2. Given that unit UH1FS proficiency training will be under instructor pilot direction to a significant degree and that full development of the present course is to be pursued, such development should be in accord with the outline described in this report.

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## APPENDIXES

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### Appendix

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- A. UHIFS IIP Instructional Process Activities
- B. Training Objective as Related to UHIFS Device Features
- C. A Course Outline for UHIFS IIP Training
- D. Practical Exercise Model (Cassette Recording)



## APPENDIX A

### UHLFS IIP INSTRUCTIONAL PROCESS ACTIVITIES

This Appendix contains a tabular listing of the instructional activities required of a UHLFS IIP in the conduct of a typical training period in the simulator. The activities are listed sequentially from pre-flight planning through post-flight student debriefing. However, it should be noted that many activities are concurrent, interactive, and/or continuous. For each major activity listed the table shows, where appropriate, (a) the general purpose of the activity, (b) the location (when changed) of the activity, i.e., where the activity takes place, (c) the cues (when newly presented) associated with initiating the activity, (d) the standards for the activity when applicable, (e) the resources or references required to support the activity, and (f) the relevant features of the UHLFS involved in performing the activity.

In the Table, resources usually have only brief shorthand identifications. More specific identification of acronyms and reference documents are provided below.

<u>RESOURCE</u>	<u>IDENTIFICATION</u>
A/C Instructor Handbook	Instructor Pilot's Handbook (Fundamentals of Instruction)
AR's	Army Regulations
DD Forms 175 and 175-1	Military Flight Plan and Flight Weather Briefing Forms
DOD FLIP	Flight Information Publications (Dept. of Defense)
FAR's	Federal Aviation Regulations
Flight Training Guide	Flight Training Guide for the UHLFS Training Course
FM1-5	Instrument Flying & Navigation for Army Aviators
FM1-30	Meteorology for Army Aviators
Form 1623	Military Flight Plan (Simulator)
IFR Supplement	Instrument Flight Rule Supplement to DOD FLIP

RESOURCE

IDENTIFICATION

Local SOP

Local Standard Operating Procedures

NOTAMS

Notices to Airmen

SID's

Standard Instrument Departure Charts

TM 38-750

The Army Maintenance Management System

UH1FS Handbook

STI-75, Flight Simulator Handbook

UH-1 Operator's Manual

TM-55-1520-210-10

# UHFS IIP INSTRUCTIONAL PROCESS ACTIVITIES

ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES	RELEVANT DEVICE FEATURES
<p>PREFLIGHT</p> <p>1. Analyze Scheduled Training Period</p> <p>a. Review goals</p> <p>b. Review objectives</p> <p>c. Identify/collect resources</p> <p>d. Recall previous experience with this block of instruction</p>	<p>Instructor familiarization with scheduled training period, typical student problems, common errors, and effective solutions used in past training</p>	<p>Flight simulator planning room</p>	<p>Assigned 1 or 2 students for a training period; specific training schedule known</p>	<p>All needed training period resources identified and collected</p>	<p>Flight syllabus, Lesson plans, Flight instruction breakdown,<sup>a</sup> AR's, FAR's, FMJ-30, FMJ-5, TM38-750,<sup>b</sup> DD Forms 175 &amp; 175-1,<sup>b</sup> DOD FLIP,<sup>b</sup> enroute charts,<sup>b</sup> SID's,<sup>b</sup> IFR supplement,<sup>b</sup> NOTAMS,<sup>b</sup> weather report,<sup>c</sup> Winds aloft report,<sup>c</sup> Rotary Wing Instrument Guide, Form 1623 or equivalent, Local SOP, UH-1 Operator's Manual, UHFS Handbook, A/C Instructor's Handbook</p>	<p>N/A<sup>d</sup></p>

<sup>a</sup>The Flight Instruction Breakdown is a tool used by IPs as an outline for the presentation of instruction. The breakdown is prepared for each maneuver and procedure in the flight syllabus and contains key teaching points, common student errors, and other cues to assist the IP in the conduct of training.

<sup>b</sup>All of the flight planning documents listed serve as reference material for subsequent training activities. Rather than repeat each of these each time it is a resource, the notation IFR Publications will be used in the remainder of the Table.

<sup>c</sup>Simulated (actual weather does not affect simulator operations).

<sup>d</sup>Not applicable.

*Winds aloft report* X 1

# UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES	RELEVANT DEVICE FEATURES
PREFLIGHT (cont.)						
2. Analyze Student Proficiency <sup>a</sup>	To relate students entry level skills to scheduled training period objectives	Flight simulator planning room		Correctly identify difference between entry level skills and scheduled training period objectives	Grade or comment slips Hard copy printout	Hard copy printer
a. Determine present student(s) proficiency						
b. Recall past experience with other students						
3. Formulate a Training Period	To aid in the subsequent planning of a training period consonant with student's proficiency			Match proposed period activities to estimated student skills		
a. Identify/modify/adjust training period goals						
b. Identify/modify/adjust period objectives						
4. Organize Learning Events	To provide a logical framework for the training period			Events sequenced in logical fashion	Flight instruction breakdown	
a. Tasks to be exposted by IP						
b. Tasks to be demonstrated						
c. Tasks to be exposted by students						
d. Tasks to be practiced by students						
e. Tasks to be critiqued by IP						

<sup>a</sup>If scheduled training period is the initial training period for the assigned students, the IIP will have to estimate student entry level skills based on preliminary knowledge regarding the student(s) and his past teaching experience. If the training period is later in the syllabus he will have first hand evidence of current student's proficiency.



UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)					
<u>ACTIVITY</u>	<u>PURPOSE</u>	<u>LOCATION</u>	<u>CUES</u>	<u>STANDARDS</u>	<u>RELEVANT DEVICE FEATURES</u>
<u>PREFLIGHT (cont.)</u>					
5. Relate Device Features to Learning Events	To identify specific device features of possible use in presentation of training	Flight simulator planning room		Effective use of UH1FS	Gaming area, performance monitoring and assessment systems, a malfunctions, automated training, freeze, slow time
6. Structure (Design) Training Period to Encompass Desired Learning Events	To provide a flight instruction activity sequence for the period		1-5 completed	In accord with MOI	
a. Identify desired initial conditions for start of training				ICs entered on Form 1623	Initial conditions sets
b. Identify desired malfunctions/emergencies to be introduced and/or practiced				Malfunctions entered on Form 1623	Simulated malfunctions
c. Prepare lesson plan				Lesson plan completed	

<sup>a</sup>Audio Alerts, Visual Alerts, Playback/Record, Hard Copy, Airspeed/Altitude Plot, Problem Time Line, Ground Track, Trainee Score Panel.

UHFS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)					RELEVANT DEVICE FEATURES
ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES
PREFLIGHT (cont.)					
6. (cont.)					
d. Formulate instructional strategies		Flight simulator planning room		In accord with MOI	IP expertise
(1) IP expositions					Auto training programs, performance assessment systems
(2) IP demonstrations					
(3) Student expositions					
(4) Student practice					
(5) IP critiques					
7. Prepare Crew Briefing	To assure briefing will be complete			In accord with MOI	Flight instruction breakdown or flight plan
a. Review maneuver/procedures					
b. Note key teaching points					
c. Note standards					
8. Present/Conduct Crew Briefing	To assure students are ready for training and know what is expected of them	Briefing room, student(s) present	Planning completed, student(s) arrive, trainer scheduled		Flight plan, Form 175 & 175-R, IFR publications, Form 1623
a. Outline training period plans					
b. Explain maneuvers/procedures					
c. Determine student's readiness for training					
(1) Ask questions					
(2) Evaluate responses					
(3) Solicit questions					
(4) Answer questions					
(5) Provide additional information					
d. Adjust or modify plans based on results of (c)					

UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)				
<u>ACTIVITY</u>	<u>PURPOSE</u>	<u>LOCATION</u>	<u>CUES</u>	<u>STANDARDS</u>
<u>PREFLIGHT (cont.)</u>				
8. (cont.)				
(e) Explain pilot/copilot (student) roles and IP expectations		Briefing room	8.d. completed	
(f) Explain desired performance standards				In accord with RW Instrument Guide, AR's, FAR's
(g) Explain IP role				Local SOP
(h) Explain SOP & safety procedures				
9. Complete Form 1623 (or equivalent)	To provide required information to console operator			Form 1623, UH1FS handbook
a. Obtain student information				
b. Select mode of operation; if auto, select program desired				
c. Specify IC				
d. Specify malfunctions				
e. Specify audio alerts				
f. Specify hard copy printer				
g. Specify ATC recorder & ATC chatter tape				
h. Specify special assistance from device operator, e.g., ATC, GCA				
				Operating modes, auto training system, initial conditions, malfunctions, hard copy printer, audio alerts, ATC chatter tape, ATC recorder
				Form 1623, UH1FS handbook
				Form 1623 100% completed

UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)					
ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RELEVANT DEVICE FEATURES
PREFLIGHT (cont.)					
10. Determine Assigned Cockpit Is Ready	To expedite training	Device operator station	Briefing completed	Cockpit located, Form 1623 and special instructions delivered	Form 1623
a. Identify assigned cockpit					
b. Give device operator 1623					
c. Give device operator special instructions					
IN COCKPIT					
1. Check Cockpit Logbook	To note any maintenance deficiencies, to maintain logbook	Cockpit <sup>a</sup>		In accord with local SOP	Logbook, SOP, UH1FS Handbook, flight gear, IFR publications, UH-1 Operator's Manual
a. Determine maintenance status				Students positioned to operate device controls effectively	
b. Make appropriate entries in logbook					
2. Set Cockpit Illumination and Ventilation Controls	To provide a comfortable learning environment		Ambient conditions	Maintain comfortable learning environment	UH1FS Handbook Illumination and ventilation system
3. Assist Students to Fasten Doors, Adjust Seats, Pedals and Controls	To assure safety of flight		Pre-flight completed, trainer ready		Motion system interlocks, restraining system, control friction system, control adjustment system

<sup>a</sup>For the in-cockpit activities in this section the IIP's normal teaching position is assumed to be the instructor/observer seat aft of the pilot and copilot positions. While some training may be conducted with the IIP in the copilot position, this position does not allow the IIP access to the information displayed on the cockpit CRT. Occasionally IIPs may conduct training from the console operator's platform. At this teaching position instructional activities remain as shown but three additional device features become relevant. These features are the overhead instrument panel, the ATC/CRT and the GCA pedestal.



# UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES	RELEVANT DEVICE FEATURES
IN COCKPIT (cont.)						
4. Monitor Trainer Status Information Panel	To ascertain current status and to cue subsequent actions	Cockpit	Indicator lights on status panel	Correctly interpret status indicators ON/OFF ON/OFF ON/OFF ON/OFF ON/OFF ON/OFF	UH1FS Handbook	Trainer Status Panel
a. Trainer Ready Light						
b. Auto copilot status light						
c. Motion system status light						
d. FREEZE status light						
e. Playback status light						
f. Instructor call acknowledge light						
5. Verify Trainer Status	To ascertain simulated aircraft is in desired configuration for start of training	Cockpit	Cockpit instrument readings, Trainer Status Panel, sound, motion, Problem Control Panel, CRT status and gaming area displays	Correctly interpret trainer status indicators and cockpit instruments	UH1FS Handbook, local SOP, IFR publications	Trainer Status Panel, Instrument Panel, audio system, seat shaker, motion system, Problem Control Panel, trainer status and gaming area displays
6. Modify Status as Needed	Correct discrepancies to obtain desired configuration	Status not as desired	Status not as desired	In accord with planned training activities	UH1FS Handbook	Intercommunications system, instructor call switch, Problem Control Panel

# UHIFS INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES	RELEVANT DEVICE FEATURES
IN COCKPIT (cont.)						
7. Present Learning Events in Proper Sequence:	To facilitate the learning process	Cockpit	Trainer status as desired	In accord with planned training activities	Flight Training Guide, UHIFS Handbook	Auto briefings, CRT display, cockpit instruments
a. Explain maneuver or procedure						
b. Demonstrate maneuver or procedure						
c. Observe/monitor student performance						
d. Critique/debrief student performance						Auto demonstrations, malfunctions, CRT display, cockpit instruments Guided practice exercises, adaptive practice exercises, non-adaptive practice exercises CRT display, Trainee Score Panel, cockpit instruments Maneuver playback, freeze, ATC playback, CRT display, Trainee Score Panel, cockpit instruments
8. Divide Attention Between Student(s) and Device	To manage & control training activities, e.g., modify approach, pace instruction	Cockpit	Student actions, CRT status, trainer status, cockpit instruments, radio communications	Correctly interpret device indicators, student actions, & communications	UHIFS Handbook, FMI-5, local SOP, Flight Training Guide	Trainer Status Panel, Trainee Score Panel, Problem Control Panel, Communication system, CRT displays, performance assessment & monitoring features

# UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

<u>ACTIVITY</u>	<u>PURPOSE</u>	<u>LOCATION</u>	<u>CUES</u>	<u>STANDARDS</u>	<u>RESOURCES</u>	<u>RELEVANT DEVICE FEATURES</u>
IN COCKPIT (cont.)						
9. Monitor Communications From Console-Interact With Console Operator a. VHF radio b. UHF radio c. FM radio d. ICS	To coordinate with console operator in order to manage and control training activities		Aircraft call sign, desire for console operator assistance	ATC procedures, correct/appropriate instructions for training problem	UH1FS Handbook, radio communication procedures, IFR publications	Communication system, instructor call switch, instructor aid acknowledge indicator
10. Record Student Performance a. Manual recording b. Request hard copy record c. Communications recording d. Record/replay	For grading, evaluation, analysis, and quality control, coaching, and feedback		Student actions, cockpit instruments, audio alerts, visual alerts, problem time	Correctly interpret/ record student performance	Flight Training Guide, and A/C Instructor's Handbook, -10 checklist, IFR publications, grade slips, other data forms	Performance monitoring and assessment features (1) Hard copy (2) Maneuver playback (3) ATC recorder (4) Ground track plotter (5) Plot area recall (6) Trainee scoring (7) Adaptive practice (8) Audio alerts (9) Visual alerts
11. Analyze Student Performance	To identify performance deficiencies (sub-standard performance) & causes of poor performance, to reinforce correct performance	Cockpit	Student actions & communications, audio alerts, visual alerts, CRT displays, instrument panel indicators	Fair & impartial interpretations	Flight Training Guide, UH1FS Handbook, -10 checklist, UH-1 Operator's Manual, A/C Instructor's Handbook, R/W Instrument Guide	Performance monitoring and assessment features

UHFS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)					RELEVANT DEVICE FEATURES
ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES
IN COCKPIT (cont.)					
12. Identify Problem Areas	Correct sub-standard performance	Cockpit	Student having problems	Correctly interpret student(s) problem(s)	
a. Motor skill					
b. Cognitive skill					
c. Discriminative skill					
d. Time sharing skill					
e. Higher order skill					
13. Formulate Solution for Problem(s)	Correct sub-standard performance		Student having problems	In accord with MOI	UHFS Handbook, Flight Training Guide, A/C Instructor's Handbook, R/W Instrument Guide
a. Additional practice needed					Parameter freeze, playback (real or slow time), demonstrations, auto briefings, problem-reset, guided practice
b. Additional information needed					
c. New approach needed, e.g., change strategy		Cockpit			Adaptive practice, non-adaptive practice
14. Propose Solution to Student, i.e., Change Training Activities	For student assimilation and subsequent learning				UHFS Handbook, Flight Training Guide, A/C Instructor's Handbook
15. Evaluate Effectiveness of Proposed Solution, e.g., Recycle Items 10-14	To determine if solution is adequate				Flight Training Guide, A/C Instructor's Handbook, R/W Instrument Guide
					Performance monitoring features: (1) Hard copy (2) Playback (3) ATC recorder (4) Ground track recorder (5) Plot area recall (6) Trainee scoring (7) Adaptive practice (8) Audio alerts (9) Visual alerts



# UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

<u>ACTIVITY</u>	<u>PURPOSE</u>	<u>LOCATION</u>	<u>CUES</u>	<u>STANDARDS</u>	<u>RESOURCES</u>	<u>RELEVANT DEVICE FEATURES</u>
<b>IN COCKPIT (cont.)</b>						
16. Critique Student Performance	To provide feedback to student	Cockpit			Flight Training Guide, A/C Instructor's Handbook, R/W Instrument Guide, IP expertise	CRT displays, CRT time histories, freeze, playback (real time), stored plots, ATC playback, audio alerts, Trainee Score Panel
a. Provide verbal comment						
b. Provide graphic display (CRT)						
c. Provide self-confrontation (playback)						
17. Solicit Questions From Students	To identify knowledge deficiencies		Student is confused/quiet, or non-responsive		A/C Instructor's Handbook, R/W Instrument Guide	
18. Answer Questions	To provide information		Student asks questions	Answer questions honestly or if answer is unknown direct student to possible source for answer	UH1FS Handbook, -10 checklist, UH-1 Operator's Manual, Flight Training Guide, A/C Instructor's Handbook, R/W Instrument Guide	Trainee Score Panel, maneuver playback, ATC playback, gaming area display

# UHFS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)

ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS	RESOURCES	RELEVANT DEVICE FEATURES
IN COCKPIT (cont.)						
19. Manage Training Period According to Student Progress & Device Status (pace instruction)	Enable student to progress at his own pace	Cockpit	Problem and clock time, student progress, fatigue, device status	In accord with appropriate training guides and lesson (flight) plan	UHFS Handbook, -10 checklist, UH-1 Operator's Manual, Flight Training Guide, A/C Instructor's Handbook, R/W Instrument Guide	Performance Monitor Features: (1) Hard copy printout (2) Playback (3) ATC recorder (4) Ground track plotter (5) Plot area recall (6) Trainee scoring (7) Adaptive practice (8) Audio alerts (9) Visual alerts
20. Complete Paperwork a. A/C logbook b. Grade slips c. Simulator training records d. Evaluation/diagnostic flight check records	Accomplish administrative requirements		Trainer period completed	Complete required forms to 100% accuracy	TM 38-750, local SOP (relative to grade slips/ training records, eval/diagnostic records)	
DEBRIEFING						
1. Review Performance During Training Period	Provide feedback to student	Debriefing room	Simulator flight completed		Written notes, hard copy printout, flight training syllabus, R/W Instrument Guide, ATC recording, grade slips	ATC playback/record, hard copy printer, stored plots
2. Inform Students of Strong and Weak Areas	Provide feedback to student					
3. Suggest Ways to Overcome Weaknesses	Enhance training		Weaknesses identified		IP expertise	

UH1FS IIP INSTRUCTIONAL PROCESS ACTIVITIES (cont.)				RELEVANT DEVICE FEATURES
ACTIVITY	PURPOSE	LOCATION	CUES	STANDARDS
DEBRIEFING (cont.)				
4. Solicit Questions	Enhance training			
5. Answer questions	Enhance training			
6. Formulate general goals for next training period; adjust syllabus as necessary	Facilitate planning		Questions asked	Flight syllabus
7. Discuss Next Training Period	Inform students of plans for next period			
8. Assign Study Material for Next Period	Facilitate student preparation for next period			UH-1 Operator's Manual, IFR publications, Flight syllabus
9. Complete Paperwork a. Grade slips b. Flight insert c. Other admin. forms	Provide necessary records	Debriefing room		Grade slips, flight insert, administrative forms
10. Dismiss Students			Training period completed	

*Review of flight syllabus*

## APPENDIX B

### TRAINING OBJECTIVES AS RELATED TO UHIFS DEVICE FEATURES

This Appendix contains a listing of 17 UHIFS features. Groups of training objectives are given for each feature. The planned course should enable the unit instrument instructor pilot to utilize these device features as stated in the objectives.

1. ATC Record/Playback - The IIP will be able to use this feature:
  - To verify clearances, readbacks, and position reports.
  - To provide feedback to students on their use of standard phraseology for ATC messages.
  - To critique students on ATC voice procedures.
2. Audio Alerts and Coaching Messages - The IIP will be able to use this feature:
  - To call attention to the fact that an out-of-tolerance condition exists.
  - As a prompter signifying that student is having difficulty controlling a particular flight parameter.
  - To assist the instructor in detecting patterns of student error.
  - In lieu of instructor verbal alerts, especially when the IP is not in the cockpit or is attending to other matters.
3. Automated Training Programs - The IIP will be able to use this feature:
  - To present a standardized description of a maneuver or procedure, including relationships between relevant controls and instruments, the performance standard associated with the maneuver or procedure, and other didactic information.
  - To supplement, or substitute for, a briefing presented by the instructor.
  - To provide an idealized, standardized model of maneuver performance (real or slow time).
4. Automatic Copilot - The IIP will be able to use this feature:
  - To relieve the IP of performing the copilot task during instruction so that he can devote full attention to other instructional activities.
  - To relieve the student of flight control tasks while he consults approach charts or other flight documents.
  - To assist the student in recovery from an unusual attitude.
  - In lieu of the freeze feature when it is desirable to continue the flight rather than freeze the training problem.
  - To supplement, or substitute for, a demonstration flown by the instructor.



- To present part-task learning situations to students whose proficiency is below that required for whole-task practice.
  - As a means of reducing the IPs task level so that more attention can be devoted to monitoring student actions.
  - As a means of matching task difficulty with a student's current proficiency level.
  - As a means of comparing student performance of a maneuver with a standardized model for the maneuver.
  - As a means of determining aviator proficiency with respect to an annual instrument checkride.
5. Communication/Navigation Display (ATC CRT) - The IIP will be able to use this feature:
- To identify or verify the appropriate frequency to use for a given facility.
  - To obtain glideslope angle information.
  - To obtain the geographical location of a facility, e.g., the X-Y location of a marker beacon.
  - To verify clearance in effect.
  - To determine the frequencies to which cockpit radios are tuned.
  - To determine the transponder code in use.
  - To formulate a request to the console operator to fail a navigational aid or to restore a previously failed aid.
  - To reposition the simulated aircraft in relation to a given navigational aid, e.g., five miles south of a marker beacon.
6. Gaming Area Display - The IIP will be able to use this feature:
- To identify the present location of the simulated aircraft within the gaming area selected.
  - To determine the distance between the simulated aircraft's present position and a particular navigational facility.
  - To monitor the ground track progress of the flight.
  - To monitor where along the ground track various student errors occur.
  - To determine that an audio alert is being given (visual signal will flash).
  - To show the student where he is in relation to a facility or other known location.
  - To show the student where he has been (feedback).
  - To illustrate what a proper ground track pattern should look like, e.g., a holding pattern.
  - To provide a cue for positioning the simulated aircraft on a desired heading or course, e.g., direct student to turn right/left x degrees.
  - To provide a cue to trigger delivery of ATC messages to the student pilot, e.g., holding instructions, approach clearances, etc.
  - To provide a cue that the student should make an ATC report.

- To provide a cue that the student should perform a specific maneuver, e.g., enter holding, missed approach.
  - To provide a cue that a preprogrammed time-activated malfunction is about to occur.
  - To provide a cue that a previously programmed time-activated (but currently unwanted) malfunction should be inhibited.
  - To determine when to request console operator to change a displayed map, e.g., simulated aircraft flies off map boundary, aircraft entering approach map area.
  - To determine when to request a GCA readout.
  - To determine that a request for X-Y relocation should be made to expedite training.
  - To determine a desired X-Y location.
  - To verify that a requested relocation has been effected and aircraft is now in desired new location.
  - To review an earlier portion of the ground track using recalled ground track.
7. Ground Controlled Approach Display - The IIP will be able to use this feature:
- To conduct GCA approaches from inside the cockpit or from the console operator's platform.
  - To present a GCA when the console operator is unavailable to do so.
  - To supplement information derived from the cockpit instruments.
8. Hardcopy Printer - The IIP will be able to use this feature:
- To obtain a permanent record of trainee performance.
  - To monitor performance during training.
  - To identify specific flight control problems.
  - To identify improper checklist procedures during engine starts.
  - To provide an aid in debriefing.
9. Initial Condition Sets - The IIP will be able to use this feature:
- To place simulated aircraft in desired geographical location and configuration to start training.
  - To move trainer to a new location and/or configuration during training.
  - To establish or modify a given IC set to suit particular training needs, e.g., change altitude, airspeed, heading, fuel weight, turbulence, etc.
10. Maneuver Record/Playback - The IIP will be able to use this feature:
- To allow the student to review his own performance.
  - To verify that a disputed event did or did not occur.
  - To relate student control inputs to instrument indications.

- To "slow down the action" to allow more time for the student to grasp important relationships between control inputs and resulting instrument indications.
  - To provide an aid in critiquing student performance.
  - To provide an aid in overcoming problems of overcontrol.
11. Overhead Panel Display - IIP will be able to use this feature:
- To monitor cockpit instruments while conducting training from outside the cockpit.
  - To time maneuvers or segments of maneuvers.
  - To provide an aid in evaluating student performance.
  - To verify that requested changes in device configuration have been made.
12. Problem Control Panel - The IIP will be able to use this feature:
- To activate/deactivate the motion system.
  - To signal the console operator to contact the cockpit.
  - To disengage the automatic copilot.
  - To insert or remove a malfunction.
  - To increase or decrease the simulated turbulence level.
  - To select and set up an auto training briefing, demonstration or exercise.
  - To reset an auto training briefing, demonstration or exercise.
  - To advance an auto training briefing, demonstration or exercise.
  - To slow down demonstrations or playbacks to 1/2 real time rate.
  - To freeze the cockpit.
  - To unfreeze the cockpit.
  - To determine that a setup is in progress, e.g., the computer is in the process of establishing initial conditions for the start of training.
13. Simulated Aircraft Malfunctions - IIP will be able to use this feature:
- To provide the student with exposure to and practice in dealing with possible UH-1 inflight emergencies and aircraft systems malfunctions.
  - To provide a safe environment in which to practice emergency procedures, particularly for those inflight failures that can not be practiced in the aircraft for safety reasons.
  - To build student confidence in his ability to handle inflight failures and malfunctions.
  - To increase training problem difficulty by increasing the student's task load.
  - To provide a means of simulating flight under partial panel or other degraded conditions.
  - To expedite training by arranging for the console operator to preselect the malfunctions initially desired on-line in advance of the training period.

14. Trainee Score Panel - The IIP will be able to use this feature:

- To monitor problem difficulty level during adaptive practice.
- To monitor cumulative errors during automated training exercises not involving adaptive practice.
- To identify the automated training problem or problem segment in progress.
- To provide a cue to the provision of student feedback.

15. Trainer Status Display (CRT) - The IIP will be able to use this feature:

- To determine the mode of trainer operation, i.e., semi, auto, or checkride.
- If trainer is in automatic mode, to determine the particular automated training period being flown.
- To determine the on/off status of the automatic copilot feature.
- To determine that aid requested of the console operator has been acknowledged.
- To determine that the simulated helicopter has weight on skids, i.e., is on the ground.
- To determine that a flight is being flown on partial panel.
- To determine that an automatic briefing is in progress.
- To determine that a ground communication is in progress.
- To determine that trainer is ready for next activity.
- To determine that a crash or freeze condition exists.
- To determine which flight parameters are frozen or unfrozen.
- To determine preprogrammed malfunction status, to including malfunctions already inserted, those available for manual insertion, and those that will occur automatically within 15 seconds unless they are inhibited.
- To determine current environmental conditions.
- To verify that requested status changes have been entered into the simulation.
- To determine elapsed problem time.
- To relate errors to problem time.
- To monitor airspeed.
- To monitor altitude.

16. Trainer Status Information Panel - IIP will be able to use this feature:

- To determine that trainer is ready for next training activity, i.e., setup is completed.
- To determine that the auto copilot system has been engaged by the console operator.
- To determine whether the trainer is frozen or unfrozen.
- To determine that the motion system is on (or off).
- To determine that the console operator is aware of IIP's call for assistance.
- To determine that a maneuver playback is in progress.



17. Visual Error Alerts - The IPP will be able to use this feature:

- To monitor where along the ground track various errors occur.
- To determine that an audio alert is being delivered.
- To provide feedback to student.
- To provide a cue that the student is having difficulty controlling a specific flight parameter.
- To alert the instructor that errors are occurring when the audio alerts may not be in use.

APPENDIX C  
A COURSE OUTLINE FOR UH1FS IIP TRAINING

This Appendix contains the outline for a proposed course of instruction for training unit instrument instructor pilots to use the UH1FS effectively. The format of the outline is modeled after that typically used to describe Army School training courses. However, the proposed course of instruction outlined here and described in the main body of the report is intended for individual training at the unit level, rather than school training, and thus does not contain all of the entries normally found in descriptions of school training courses.

# SECTION I: PREFACE

- A. Course Title: UHlFS Instrument Instructor Pilot Training Course
- B. Purpose: To provide Commissioned, and Warrant Officer, instrument instructor pilots with a training program to qualify them to utilize the UHlFS effectively as an instructional vehicle.
- To enable instructor pilots to conduct instrument proficiency or refresher training and to conduct initial issue instrument qualification training in the UHlFS.
- C. Prerequisites: Commissioned, or Warrant Officer UH-1 Instrument Instructor Pilots.
- D. Note: This course is designed as a largely self-paced, self-taught, proficiency advancement course employing individualized instruction. The course design does not require it to be employed in its entirety; rather, it provides for multiple student entry points and is designed to take advantage of previously acquired trainee skills and knowledges in the UHlFS. The hours shown for completion of individual learning modules are approximations only.
- E. Training Locations: UHlFS Field Sites
- |                            |                     |                        |                 |
|----------------------------|---------------------|------------------------|-----------------|
| F. SSI/MOS Feeder Pattern: | Prerequisite        | Trained in this course | Feeds following |
| Commissioned Off:          | 15A                 | None                   | None            |
| Warrant Officer:           | 100B,C,D,E, or 120A | None                   | None            |
- G. Ammunition Requirements: None
- H. Selected Training Recapitulation: Not applicable
- I. Standardization of Prefix Digit 5 Training: Not applicable
- J. Essential Training Recapitulation: Not applicable

## SECTION II: SUMMARY

Total Hours: 45 (approximately)

	<u>Hours</u>
A. Learning Modules:	
Introduction to UH1FS	3
Introduction to in-cockpit Device Operations	3
In-cockpit Operations	6
Performance Assessment Features	6
Record/Playback Features	3
Automated Training Programs	9.5
Console Operations	3
Administrative Records & Forms	1
Practice Teaching	<u>10.5</u>
Total	45
B. Recapitulation:	
Security Classification	
Secret	0
Confidential	0
Unclassified	<u>45</u>
Total	45
Type of Instruction	
Television	1.3
Practical Exercises/Examination	35.7
Individual Study	8
Non-Academic	<u>0</u>
Total	45



### SECTION III: LEARNING MODULES

#### MODULE ONE: INTRODUCTION TO THE UH1FS

##### Content Areas:

1. General Introduction to the UH1FS and the UH1FS IIP Training Program

Objective: To provide the IIP with an overview of the UH1FS as a training system and to provide a description of the scope of the course and the supporting media employed.

References: Video Tape Recording (VTR) 2C-011-0447B, UH1FS Operator's Manual, UH1FS Instructor's Guide, Student Handout (this handout will contain an explanation of the organization of the course and the cassette recordings, a description of each practical exercise, and a listing of order of use.)

2. Local Standing Operating Procedures (SOP)

Objective: The IIP will be able to specify safety procedures and operating rules related to UH1FS operations.

References: Local SOP and UH1FS Operator's Manual

3. Orientation Flight in UH1FS (Practical Exercise)

Objective: The IIP will be able to recognize the basic flight characteristics and flight control responses of the UH1FS and utilize operational capabilities of the navigation/communication equipment while flying solo in the left seat of the UH1FS. (See Appendix D for a description of the exercise.)

References: Rotary Wing Instrument Guide, UH1FS Operator's Manual, DOD FLIP, FM 1-5, Cassette Number (to be determined)

4. Introduction to Console Operator Duties and Responsibilities

Objective: To provide the IIP with a briefing on the duties and responsibilities of the console operator.

References: Console operator briefing, UH1FS Operator's Manual, UH1FS Instructor's Guide

## MODULE TWO: INTRODUCTION TO IN-COCKPIT DEVICE OPERATIONS

### Content Areas:

#### 1. Safety Considerations and SOP

Objective: The IIP will be able to apply safety considerations and SOP during activation of the UH1FS.

References: Local SOP, UH1FS Operator's Manual

#### 2. Lighting and Ventilation

Objective: The IIP will be able to activate and control the UH1FS lighting and ventilation systems.

References: UH1FS Operator's Manual

#### 3. Motion System Interlocks

Objective: The IIP will be able to describe the function of the motion system interlocks, identify their locations, and activate and deactivate the motion system of the UH1FS from the cockpit.

References: UH1FS Instructor's Guide, UH1FS Operator's Manual, VTR 191-011-0478B

#### 4. Problem Control Panel

Objective: The IIP will be able to locate the problem control panel; be able to identify, describe the functions of, and activate the following device controls: MOTION, CONTINUE, FREEZE, INSTRUCTOR CALL.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 5. Trainer Status Information Panel

Objective: The IIP will be able to locate the trainer status panel, and describe its functions.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 6. Practical Exercise

Objective: To familiarize the IIP with applying SOP, and the location and functions of the controls identified in areas 2-5 above.

References: UH1FS Instructor's Guide, Local SOP, Cassette Number (to be determined)

7. Gaming Area Map Display

Objective: The IIP will be able to locate the Gaming Area Display on the cockpit CRT, recognize the cross-country map, approach maps, identify the displayed symbols, recognize map scales, and request map changes from the console operator.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

8. Practical Exercise

Objective: To familiarize the IIP with the format and type of information shown on the Gaming Area Map Display.

References: UH1FS Instructor's Guide, Cassette Number (to be determined)

MODULE THREE: IN-COCKPIT OPERATIONS, CONTINUED

Content Areas:

1. Problem Control Panel

Objective: The IIP will be able to locate, identify, and describe the function of the following switches and lights: Malfunction, Set Up, In Progress, Advance, Slow, Reset, Auto Co-pilot, and Thumbwheel Selector.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

2. Trainer Status Display (CRT)

Objective: The IIP will be able to locate the Trainer Status Display area of the CRT, identify the various status groupings, and interpret status symbols.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

3. Auto Co-Pilot

Objective: The IIP will be able to describe the function of the auto co-pilot, to enable and disable it, and identify typical uses.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

4. Practical Exercise

Objective: To familiarize the IIP with the use of the auto co-pilot.

References: UH1FS Instructor's Guide, Cassette Number (to be determined)

5. Parameter Freeze

Objective: The IIP will be able to identify parameters that can be frozen, access them and identify typical use.

References: UH1FS Operator's Manual UH1FS Instructors Guide, VTR 191-011-0659B

6. Practical Exercise

Objective: To familiarize the IIP with UH1FS flight characteristics when individual flight parameters are frozen.

References: UH1FS Instructor's Guide, Cassette Number (to be determined)



## 7. Malfunctions

Objective: The IIP will be able to select, activate, and deactivate malfunctions from the cockpit.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide, UH1H-10 (Emergency Procedures Checklist), Malfunction Analysis Chart

## 8. Practical Exercise

Objective: To familiarize the IIP with those simulated aircraft malfunctions with which he may be unfamiliar.

References: UH1FS Instructor's Guide, UH1H-10, Malfunction Analysis Chart, Cassette Number (to be determined)

## MODULE FOUR: PERFORMANCE ASSESSMENT FEATURES

### Content Areas:

#### 1. Visual Error Alerts

Objective: The IIP will be able to describe the visual error alert system and read the interpret the alert symbols.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide, VTR 191-011-652B

#### 2. Audio Alerts

Objective: The IIP will be able to describe the audio alert system, identify individual alert messages, and be able to enable and disable the alerts in part or in toto.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 3. Coaching Messages

Objective: The IIP will be able to describe the coaching message system, identify individual messages and message cues, and be able to enable/disable messages in part or in toto.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 4. Ground Track Plots

Objective: The IIP will be able to identify the location and direction of travel of the simulated aircraft from the ground track plot, know the parameters of operation, and how to erase and recall plots.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 5. Practical Exercise

Objective: To familiarize the IIP with the operation of visual and audio alerts, coaching messages, and ground track plots.

References: UH1FS Instructor's Guide, UH1FS Operator's Manual, Cassette Number (to be determined)

#### 6. Hardcopy Printout

Objective: The IIP will be able to identify the hardcopy printer, describe its functions, know how to access it, and be familiar with its potential uses.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

## MODULE FIVE: RECORD/PLAYBACK FEATURES

### Content Areas:

#### 1. Maneuver Record/Playback

Objective: The IIP will be able to describe the maneuver record/playback system, how to access it, its operational range and limitations, control, and function, in both real and slow time.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 2. ATC Record/Playback

Objective: The IIP will be able to identify the system, describe its method of operation (cueing), and know how to access it and its typical uses.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide

#### 3. Practical Exercise

Objective: To provide the IIP with hands-on experience in using the UH1FS record and playback systems.

References: UH1FS Instructor's Guide, Cassette Number (to be determined)

## MODULE SIX: AUTOMATED TRAINING PROGRAMS

### Content Areas:

#### 1. Briefings

Objective: The IIP will be able to describe automated briefings and know how to access them from the cockpit.

References: UH1FS Instructor's Guide, Automated Briefing Scenarios

#### 2. Demonstrations

Objective: The IIP will be able to describe Demo programs, identify content, and select and activate programs from the cockpit.

References: UH1FS Instructor's Guide, Automated Demonstrations

#### 3. Guided Practice Exercises

Objective: The IIP will be able to identify exercises involving guided practice, describe them, and select and activate them from the cockpit.

References: UH1FS Instructor's Guide, Guided Practice Exercises

#### 4. Adaptive Practice Exercises

Objective: The IIP will be able to identify exercises involving adaptive practice, describe them, and select and activate them from the cockpit.

References: UH1FS Instructor's Guide, Adaptive Practice Exercises

#### 5. Non-Adaptive Practice Exercises

Objective: The IIP will be able to identify programs involving non-adaptive practice, describe them, select and activate them, know their function and operation, and be familiar with suggested uses.

References: UH1FS Instructor's Guide, Non-Adaptive Practice Exercises

#### 6. Trainee Score Panel

Objective: The IIP will be able to locate the trainee score panel, know how to turn it on and off, and be able to interpret the numeric display for each automated program.



References: UH1FS Operator's Manual, UH1FS Instructor's Guide

7. Practical Exercise

Objective: To familiarize the IIP with the contents of automated training demonstrations and exercises by having him fly through a representative sample of them.

References: UH1FS Instructor's Guide, Automated Training Programs, Cassette Number (to be determined)

8. Automated Checkride

Objective: The IIP will be able to describe the automated checkride, know how to access the checkride, and know the communications and other IIP requirements during checkride mode operations.

References: UH1FS Instructor's Guide, Auto Checkride

9. Practical Exercise

Objective: To familiarize the IIP with the contents of the automated checkride by having him fly the checkride.

References: UH1FS Instructor's Guide, UH1FS Operator's Manual, AR 95-63, DOD FLIP, FM 1-5, FM 1-30, Rotary Wing Instrument Guide, AIMS Part 1 and 3, AR 95-1.

## MODULE SEVEN: CONSOLE OPERATIONS

### Content Areas:

#### 1. Initial Conditions

Objective: The IIP will be able to describe initial conditions, identify and interpret them, select and/or identify modifications to them, and now how to request changes from the console operator.

References: UH1FS Operator's Manula, UH1FS Instructor's Guide, VTR 191-011-566B

#### 2. Practical Exercise

Objective: To familiarize IIP with UH1FS initial condition sets and their modifications by observing console operator manipulation of the system.

References: UH1FS Instructor's Guide, UH1FS Operator's Manual, Cassette Number (to be determined)

#### 3. GCA Display

Objective: The IIP will be able to describe the GCA display, know which GCA facilities are available, know operating constraints, and be able to conduct GCA from the console or from the instructor station in the cockpit.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide, ATC Procedures for GCA, TM 1-5, TM 11-2557-29, TM 11-2557-30, PT 5170111 1515A

#### 4. Overhead Panel Display

Objective: The IIP will be able to identify and interpret the instruments, gauges, and digital readouts on the overhead panel display and select desired cockpits.

References: UH1FS Operator's Manual, UH1FS Instructor's Guide, FM 1-5

#### 5. Practical Exercise

Objective: To familiarize the IIP with the content of a GCA approach using the information available at the console operator's station, i.e., overhead panel display and GCA display.

References: Cassette Number (to be determined)

MODUEL EIGHT: ADMINISTRATIVE RECORDS AND FORMS

Content Areas:

1. Records and Forms

Objective: The IIP will be able to properly prepare and/or complete the following forms as required: Form 1623 or equivalent, DASH 12 and 13, and Grade Slips.

References: DOD FLIP, TM 38-750, Local SOP

2. Practical Exercise

Objective: Complete required forms to 100% accuracy.

References: Local SOP, administrative forms

MODULE NINE: PRACTICE TEACHING

Content Areas:

1. Practical Exercises(s)

Objective: Conduct one or more diagnostic flights in the UH1FS.

References: Proficiency Syllabus, UH1FS Instructor's Guide

2. Practical Exercise(s)

Objective: Conduct one or more Instrument Proficiency Syllabus Training Periods (IFR Cross-Country Flight) from the instructor's station utilizing device features and systems as appropriate.

References: Proficiency Syllabus, DOD FLIP, UH1FS Instructor's Guide

3. Practical Exercise(s)

Objective: Conduct one or more proficiency training periods (in two cockpits simultaneously), from the console operator's platform using information available at the console operator's station.

References: UH1FS Instructor's Guide, DOD FLIP, Proficiency Syllabus

4. Practical Exercise(s)

Objective: Conduct one or more Initial Issue Syllabus training periods in the UH1FS.

References: UH1FS Instructor's Guide, Initial Issue Syllabus

5. Practical Exercise(s)

Objective: Conduct one or more automated checkrides in the UH1FS.

References: UH1FS Instructor's Guide, Rotary Wing Instrument Guide, Automated Checkride



## APPENDIX D

### PRACTICAL EXERCISE MODEL (CASSETTE RECORDING)

This Appendix contains an abbreviated model of the practical exercises listed in the course outline. The model includes the identification of the exercise, the prerequisites for the exercise, the objectives and purpose, the initiating actions required of the IIP (and console operator), and the instructions or directions, i.e., the scenario that would be recorded on the cassette tape. The model is intended to serve as a guide for future course developers who will complete the development of the exercises identified in the course outline.

PRACTICAL EXERCISE: UH1FS Orientation Flight  
(Module One - content area 3)

#### OBJECTIVES:

The IIP will be able to recognize the basic flight characteristics and control responses of the UH1FS and utilize the operational capabilities of the navigation/communication equipment. Specifically in this practical exercise the IP will become familiar with the following while flying in the left seat of UH1FS:

- Aircraft control feel and response
- Navigation radio tuning and indications and communications radio tuning
- Location and function of the simulator controls CONTINUE, FREEZE and MOTION.

#### PURPOSE:

The purpose of this orientation flight is to accomplish the objectives stated above by having the IIP fly a relatively short attitude instrument flight utilizing all of the attitude instruments to fly straight and level, perform level turns, straight climbs and descents, climbing and descending turns, and ADF and VOR orientations and tracking exercises. The entire flight is flown in the left seat of the UH1FS.

#### PREREQUISITES:

The IIP will have read the Instructor's Guide section on Problem Control Panel, specifically the part treating the location and function of the MOTION, FREEZE, and CONTINUE switches. The IIP will have also

viewed the video tape and consulted the other references given in the course outline for Module One, i.e., local area SOP and UH1FS Operator's Manual.

#### EQUIPMENT REQUIREMENTS:

- (a) Flight helmet
- (b) FLIP local training area navigation chart
- (c) Cassette player and cassette tape NR 1-3
- (d) UH1FS Instructor's Guide

#### NOTE:

This scenario is written as if the cassette player were a standard commercially available model with a play, record, rewind, and stop switch. It would be preferable to have the type of player that would stop automatically at the end of each short message and have to be started manually when the instructor was ready for the next message.

It would also be desirable to have a "Y" extension cord, in order to adapt the cassette to play through the pilot's helmet receiver system.

#### INITIATING ACTIONS:

- (1) The IIP must inform console operator he is going to take an orientation flight in the UH1FS and needs the following initial device conditions:<sup>1</sup>
  - (a) An airborne setup (appropriate for the local area) in a training area within range of a VOR, NDB, or ILS localizer. Altitude 3000 feet AGL, 90 kts airspeed, heading optional (any acceptable), WV = 0, WD = 0, TURB LVL = 0, SOUND LVL = 3, and RADIO STATIC 1; (the other flight parameters associated with an airborne setup are acceptable)
  - (b) Local communication frequencies for UHF, VHF, FM.
- (2) The IIP will climb the ladder to motion platform walkway and start cassette for first recorded instruction.

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<sup>1</sup> Initial device conditions for each exercise will be needed and should be printed on a card that the IIP can hand to or discuss with the console operator at the beginning of the exercise.

RECORDED INSTRUCTIONS:

- (1) Instruction: "This orientation flight in the UH1FS is intended to familiarize you with the flight characteristics and control responses of the simulator, the navigation and communication radios, and the location and function of the CONTINUE, FREEZE, and MOTION switches. You should be able to follow the recorded instruction without difficulty. If you are uncertain of the location of the device controls referenced in this exercise, consult your UH1FS Instructor's Guide. Check that pilot's door and rear door are closed and secure; enter left front door to cockpit and adjust seat; secure safety belt and shoulder harness; secure door. Stop cassette until these actions are completed, then when ready, start cassette again."
- (2) Instruction: "Connect helmet to communications jack plug on the cord behind your seat; tune UHF, VHF, FM radios to local frequencies; stop cassette; when ready to continue start cassette again."
- (3) Instruction: "The console operator has erected the ladder and checked to see if motion area is clear; set co-pilot's (left) communications control panel receiver 1, 2, 3, INT, and NAV to on; set transmitter switch to 3; call console operator on FM (3) using floor switch or cyclic switch and request clearance to go on motion, stop cassette; when cleared to go on motion start cassette again."
- (4) Instruction: "Locate the MOTION switch on lower left hand corner of the problem control panel and press it. The motion system will now erect to the ready-for-flight position. It takes approximately 30 seconds for the system to erect and you will feel two bumps as it stabilizes in position. The simulator will then be ready to fly. Take a few minutes to familiarize yourself with the instrument panel and the radio control console (center pedestal). Also note the position of the aircraft switches and controls to insure they are in the correct position for flight (e.g., force trim, emergency fuel governor, inverter, generator, throttle full open, etc.). Stop the cassette until this has been accomplished, then when ready, start cassette again."
- (5) Instruction: Now that you are ready to fly, tune and identify local nav aids on the VOR and NDB, and note directions to stations. Stop the cassette while you set radios, then start cassette again."

- (6) Instruction: Now you have located your position in the instrument training area and you should be oriented. Locate the CONTINUE switch on the upper left hand corner of the problem control panel. When you press it you will have the aircraft controls released to your control and you will have to fly the simulated aircraft. Note the location of the FREEZE switch on the problem control panel. It is the third switch down in the second row of switches. If for any reason you desire to stop the simulated aircraft, press this switch. Now press the CONTINUE switch. Note time. Fly the aircraft straight and level and note control feel, control response and instrument responses. Then execute several standard rate 90° left and right level turns and then several 180° level left and right turns. Stop the cassette until you are finished with the level turn series, then start cassette again for next instruction."
- (7) Instruction: "Now that you have a feel for the aircraft, try a standard rate climb for 1000 feet and a standard rate descent for 1000 feet, again noting control response and instrument responses. Also try a left and a right 180° climbing and descending turn. Stop the cassette until you have finished these maneuvers, then start cassette again."
- (8) Instruction: Next, turn to the NDB and home on the beacon for approximately 2 minutes and note the number one needle response on the RMI, then do the same with the number two needle for the VOR station. Stop cassette until you complete the VOR/ADF orientation and are again in FREEZE, then start cassette again. Press CONTINUE to begin."
- (9) Instruction: "This is the end of the orientation flight. You should be familiar with the following:

aircraft control response;  
nav radio tuning and indications;  
communication radio tuning.

You should also be familiar with the CONTINUE, FREEZE, and MOTION switches on the problem control panel. Now call the console operator on the VHF radio and request permission to come off motion. When he responds, press the MOTION switch. It will take approximately 30 seconds from the time you press the switch until the motion platform settles. Log your flight on the -12 and -13 in the log book and depart the cockpit. If you need more time, you can reschedule and repeat this period. If not, your next practical exercise will be on cassette number (to be determined)."